

CLAIMS

What is claimed is:

1. A method for coordinating channel power information in a wavelength division multiplexed optical communications system having at least a first and a second network element, the method comprising:

gathering information on local communications assets local to the first network element including launch path power values and channel information of the wavelength division multiplexed channels output from the first network element;

determining channel weighting values for the wavelength division multiplexed channels output from the first network element based on the launch path power values and the channel information; and

transmitting the channel weighting values from the first network element to the second network element.

2. The method for coordinating channel power information according to claim 1,

wherein the channel information includes channel format and data rate information for the channels,

said transmitting step transmitting the channel weighting values and channel information from the first network element to the second network element.

3. The method for coordinating channel power information according to claim 1,

wherein the channel information includes channel frequency, channel format and data rate information for the channels,

said transmitting step transmitting the channel weighting values and channel information from the first network element to the second network element.

4. The method for coordinating channel power information according to claim 1, wherein the first network element is capable of injecting at least one channel into the network, the method further comprising:

controlling the launch power of the at least one injected channel according to the launch path power values.

5. The method for coordinating channel power information according to claim 4,

wherein the WDM channels are divided into bands of channels such that all channels in particular band have substantially the same launch path power value;

said controlling step being performed on a per-channel-band basis.

6. The method for coordinating channel power information according to claim 4,

said controlling step including adjusting a variable optical attenuator in the launch path of the at least one channel according to the launch power settings.

7. The method for coordinating channel power information according to claim 4,

said controlling including adjusting an output power of a transmitter transmitting the at least one channel according to the launch power settings.

8. The method for coordinating channel power information according to claim 1, wherein the wavelength division multiplexed optical communications system has a plurality of network elements including the first and second network elements, the method further comprising:

transmitting network topology information to the network elements including channel source and channel block information for each of the channels and connectivity between the network elements.

9. The method for coordinating channel power information according to claim 1, wherein the channel weighting values represent a channel power value normalized by a reference channel power value.

10. The method for coordinating channel power information according to claim 9, wherein the reference channel power value is the amount of power typically used for a 2.5Gbps WDM channel.

11. The method for coordinating channel power information according to claim 1, further comprising:

storing the launch path power values, the channel weighting values, and the channel information in a database operatively connected to the first network element; and

said gathering step accessing the database to gather information on local communications assets local to the first network element.

12. A method for using coordinated channel power information in a network element of a wavelength division multiplexed optical communications system carrying a plurality of channels, the method comprising:

receiving channel weighting values and channel information for wavelength division multiplexed channels generated upstream of the network element;

determining a set of in-view channels that are passing through a point in the network element based on the channel information;

calculating a reference value according to channel weighting values corresponding to the set of in-view channels; and

utilizing the reference value as a basis for managing at least a portion of the network element corresponding to the point through which the in-view channels pass.

13. The method for using coordinated channel power information in a network element according to claim 12, wherein the channel information includes frequency information identifying the channels generated upstream of the network element,

said receiving step also receiving upstream topology information concerning upstream network elements upstream of the network element; and

said determining step determining the set of in-view channels that are passing through a point in the network element based on the channel information and the upstream topology information.

14. The method for using coordinated channel power information in a network element according to claim 12,

said receiving step including receiving source objects, wherein each of the source objects includes the channel weighting value and frequency of one of the channels generated upstream of the network element.

15. The method for using coordinated channel power information in a network element according to claim 12,

said receiving step including:

receiving source objects, wherein the source objects include the channel weighting values and frequencies of the channels generated upstream of the network element; and

receiving at least one block object, wherein the at least one block object includes a frequency of a blocked channel blocked upstream of the network element.

16. The method for using coordinated channel power information in a network element according to claim 15,

said determining a set of in-view channels step correlating the source objects and the at least one block object to determine which channels are passing through a point in the network element.

17. The method for using coordinated channel power information in a network element according to claim 12,

said receiving step including:

receiving source objects, wherein each of the source objects includes the channel weighting value and frequency of one of the channels generated upstream of the network element;

receiving at least one amp object, wherein each of the at least one amp objects includes information identifying an upstream optical amplifier;

receiving upstream topology information specifying upstream network topology upstream of the network element; and

determining object receipt completeness by correlating the source objects, the at least one amp object and the upstream topology information.

18. The method for using coordinated channel power information in a network element according to claim 12,

wherein the channel information includes information on whether channels are enabled or not;

said determining step determining the set of in-view, enabled channels that are passing through a point in the network element based on the channel information.

19. The method for using coordinated channel power information in a network element according to claim 12,

said utilizing step triggering an alarm condition based on the reference value.

20. The method for using coordinated channel power information in a network element according to claim 12,

said utilizing step controlling at least a portion of the network element corresponding to the point through which the in-view channels pass based on the reference value.

21. The method for using coordinated channel power information in a network element according to claim 12,

wherein the network element includes an optical amplifier, the method further comprising:

said determining step determining a set of in-view channels that are passing through the optical amplifier based on the channel information;

said calculating step summing the channel weighting values corresponding to the set of in-view channels;

said utilizing step controlling amplifier gain based to the summed channel weight values.